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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/641,720	08/15/2003	Toshihiro Suzuki	2803.68281	2147
24978	7590	06/20/2005	EXAMINER	
GREER, BURNS & CRAIN 300 S WACKER DR 25TH FLOOR CHICAGO, IL 60606			CARIASO, ALAN B	
			ART UNIT	PAPER NUMBER
			2875	

DATE MAILED: 06/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/641,720	Applicant(s) SUZUKI ET AL.	
	Examiner Alan Cariaso	Art Unit 2875	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) 15-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>20050401</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Election/Restrictions

2. Applicant's election without traverse of Group I, claims 1-14 in the reply filed on May 31, 2005 is acknowledged.
3. Claims 15-48 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Groups II and III, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on May 31, 2005.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the truncated pyramid is joined with the light guide plate by an adhesive member and refractive index of the adhesive member is n and an angle between the slope of the adhesive member and a line parallel to an axis of the truncated pyramid is α (claim 7) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate

prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 7, line 5, the limitation "the slope of the adhesive member" is indefinite as the same as or different from the "slope extending between said base and said top" (of the truncated pyramid) of preceding claim 1.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-3, 5, 8-10, 12 and 14 (dependent on claims 1-3, 5, 8-10 and 12) are rejected under 35 U.S.C. 102(b) as being anticipated by PARKER (US 5,613,751).

10. PARKER a lighting unit (fig.7) comprising a light guide plate (42), a light source (3), and a truncated pyramid (43) arranged between the light guide plate (42) and the light source (3), said truncated pyramid (43) having a base (inner dotted line at periphery of plate 42), a top (outer dotted line adjacent 3) smaller than the base, and a slope extending between said base and said top (fig.7), said light source (3) being arranged in close contact with said top of the truncated pyramid (43), said light guide plate (42) being arranged in close contact with said base (inner dotted line) of the truncated pyramid (43), so that light is propagated from light emitting part of the light source (3) to the light guide plate (42) without passing through any air layer; wherein said truncated pyramid (43) and said light guide plate (42) are integrated with each other (col.2, lines 65-66), and the light source (3) is attached (col.3, line 46-48) to the truncated pyramid (43); wherein said light source (3) and said truncated pyramid (43) are integrated with each other (col.3, lines 49-59), and the truncated pyramid (43) is attached (col.3, lines 4-6) to the light guide plate (42); wherein the truncated pyramid (43) inherently has a refractive index and is shown to have an angle (fig.7) between the

slope between the slope and a line parallel to an axis (the linear direction of electrodes of light source 3) of the truncated pyramid (43), the slope angle of the pyramid (43) being about 30-45 degrees (observed to be around midpoint of 90 degrees, or acute angles of a right triangle adjacent pyramid 43 shown in fig.7); wherein the light emitting part or surface (square portion) of the light source (3) is smaller than or equal to the top (outer dotted line) of the truncated pyramid (43); further comprising a reflecting member (10, fig.2) placed to at least partially surround the light source (3, col.3, lines 11-25) and the truncated pyramid (6, fig.2); wherein the light source (3) comprises at least one LED (col.7, line 9); and a display element (col.8, lines 56-67).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 4, 6, 7 and 14 (dependent on claims 4, 6 and 7) are rejected under 35 U.S.C. 103(a) as being unpatentable over PARKER (US 5,613,751) in view of UNGER et al (US 6,164,789).

13. PARKER discloses the claimed invention including the truncated pyramid (4,6,12,43) having an inherent refractive index and is shown to have a slope angle. However, PARKER does not disclose: the angle (α) of the slope of the truncated pyramid being equal to or greater than arcsine (1/n) (claim 4); the truncated pyramid

(43) comprising an adhesive member (claim 6); and an adhesive member joining the truncated pyramid to the light guide plate, and the angle (α) of the slope of the adhesive member being equal to or greater than arcsine ($1/n$) (claim 7).

14. UNGER teaches a tapered coupling waveguide (210, fig.8) loses light when light reaches the tapered walls at less than the critical angle $\theta_c = \sin^{-1}(n_1/n_2)$ (Snell's law, col.4, lines 47-65) where n_1 is refraction index of air (essentially $n_1=1$ for air) and n_2 is the refraction index of the waveguide (210) for the purpose of producing a taper angle that would minimize light loss in guiding light to a second light guide panel or plate (220). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the truncated pyramid of PARKER to include a taper angle that is greater than or equal to the critical angle $\theta_c = \sin^{-1}(n_1/n_2)$ in order to maximize light propagation there within to reach the attached light guide plate.

15. UNGER further teaches an optically transparent adhesion layer (240, fig.8, col.3, lines 62-67) fusing the tapered coupling waveguide (210) to the light guide plate (220), the adhesion layer having an index of refraction substantially equal to that of waveguides (210,220) for the purpose of maximizing light transfer therebetween. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the separate attached pieces of the light transition pyramid and light emitting panel of PARKER (col.3, lines 4-6) to include the type of adhesion layer between them as taught by UNGER in order to maximize light transfer.

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16. Claims 11, 13 and 14 (dependent on claims 11 and 13) are rejected under 35 U.S.C. 103(a) as being unpatentable over PARKER (US 5,613,751) in view of TAI et al (US 5,390,276).

17. PARKER discloses the claimed invention except a light absorbing member located near a border between the light guide plate and the truncated pyramid.

18. TAI '276 teaches light absorbing coating (72, figs. 1-2B, col.7, lines 10-68) on the light collimating pipe (48) near the border (16) between the light guide plate (14) and the transition pipe (48) for the purpose of limiting light reflection of greater than a certain angle θ to internally reflect and collimate light toward the input edge or border (16) of the light guide plate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the light emitting panel assembly of PARKER to include light absorbing material near the common light guide border as taught by TAI et al '276 in order to maximize collimated light toward the light guide plate's reflective surface to emerge as collimated backlighting to sectional-specific LCD.

Conclusion


19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. MILLIKAN et al (US 5,883,684) show an adhesive (60, fig.5) forming an encapsulating support of tapering shape with surrounding reflective member (50,51) about LED light source(s) (32) adjacent the side edge of the light guide plate (36), to minimize light loss. FUKUI et al (US 5,986,727) show an integral pyramid section (4) of slope angle θ , an adjacent light source (1) directing light toward the

remaining light panel (2). HIYAMA et al (US 6,104,454), ABDALA Jr. (US 4,630,895), TAI et al (US 5,359,691) show other light guide plates with attached truncated pyramids or transition prisms between the plate and light source.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Cariaso whose telephone number is (571) 272-2366. The examiner can normally be reached on 9-5:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (571) 272-2378. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free)



Alan Cariaso
Primary Examiner
Art Unit 2875

June 14, 2005
AC